Coach Washing Line Design

- What are the issues with existing washing line designs?
- What are the best options to address these issues?
- Within the available constraints, can we address some of these issues, and make a better washing line at RBL?

Basics on Washing line designs

Purpose: To assist staff while they attend to coaches during the maintenance of coaches.

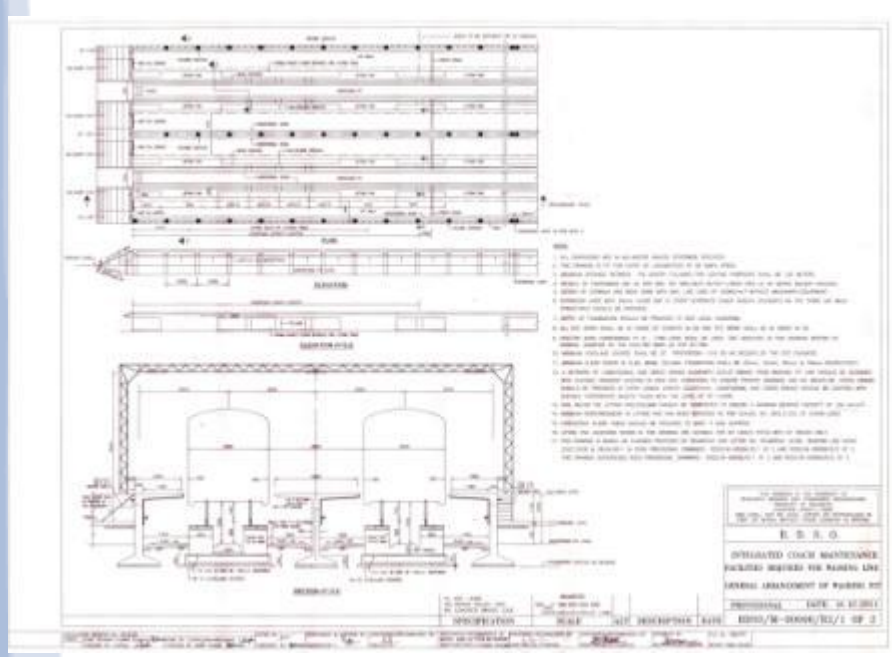
Coaching maintenance:

- Under gearing examination
- Minor repairs to the under-gearing
  - Ultramodern designs can also address major repairs
- Cleaning of outside of coach
- Inside cleaning of coach

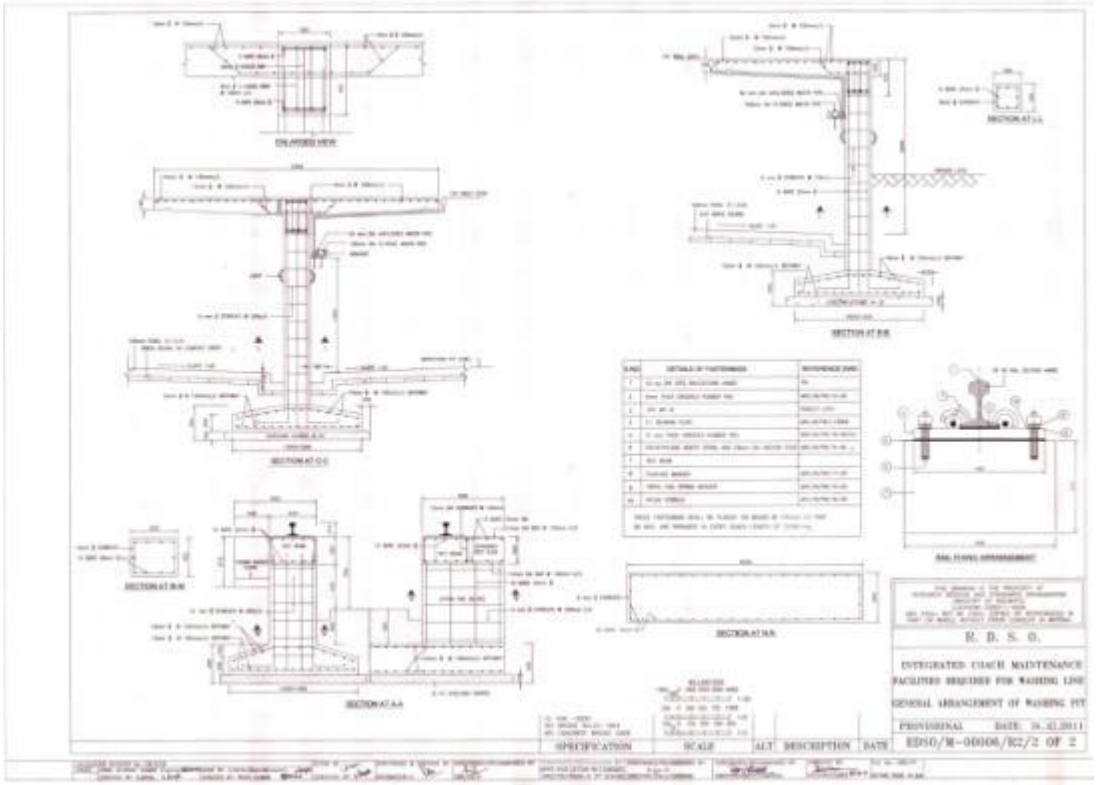
Existing designs

- IR CAMTECH 2.0 Oct'99
- L39 CAMTECH Drawing 2001
- RDSO M-00006/R1/Dt 28.09.2006
- RDSO M-00006/R2/1 Dt. 14.10.2011

Latest Washing Line Design



- 2 level
- Wide platforms
- Enable spring change



- N type portal
- Fit for entry of locomotive at 30 Km/Hr

L-39 Design – LKO/SLN washing lines under const

2006/2011 Design – NER LKO Washing/Line

How to analyze washing line design?

Extend to which a washing line can give quality output and reduce damage to coaches

- Number and Length
- Number of levels on which staff can work
- Features- drop pit, car washing plant, high pressure jet cleaning, enable spring change, portal lighting,
- Traffic restrictions
- Straight/ Curved

Levels of working

- Levels at which staff can stand
  - Rail Level apron
  - Inside Pit
  - Catwalk
- More complicated designs have uptill 7 levels
  - Primarily for attention to locomotives, EMU, vehicles with driving units(DEMU).

An Evaluation

Item	Pit Level	Rail Level	Catwalk Level
Pit line examination	Required	Makes the pit blind	Makes pit dark and damp
Attention to undergearing items	Easy	Sit and attend	Darkness in pit
Getting inside coach	Very Difficult	Difficult	Easy
Outside washing	Not possible	Long handle brush, Scissor trucks	Easy access
Inside attention	NA	Climb in	Easy access
Outside attention	Not possible, lift of 5 meters required	Difficult, Scissor trucks required	Minor Problem, ladders required for some attention

BHOPAL – Two kinds of washing lines side by side

BHOPAL Old Pit (No Catwalk)

- **This is also sometimes called a blind pit design, as the pit is closed**
- **Contractual outside cleaning using long handle brushes**
- **Difficulty in climbing inside the coaches**

BHOPAL New washing line (with Catwalk)

- 3 level
- Wide platforms
- Enable spring change

- Rail on pillars, opening up the pit area

Mumbai Kurla No-catwalk washing line

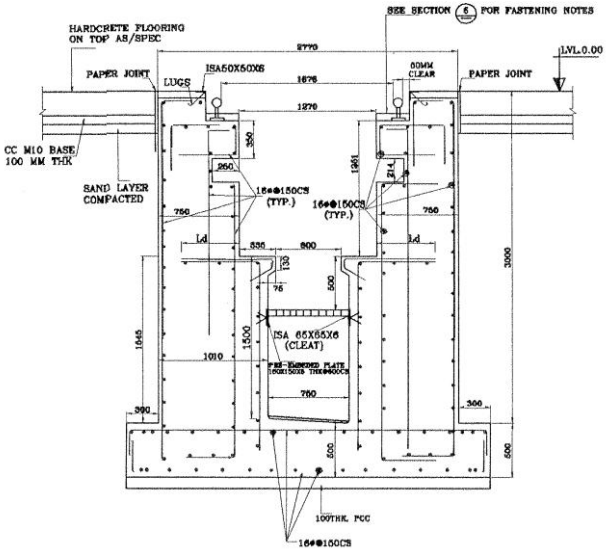
- 2 level
- No platforms
- Long handle for outside cleaning

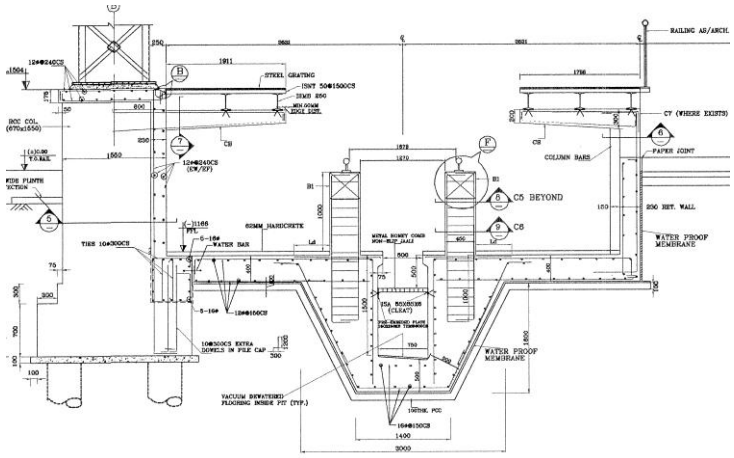
EMD LOCOMOTIVE PIT

- 3 level
- Wide platforms
- One cannot climb into the vehicle from the pit level

DMU Car Shed Pit

- Multiple levels
- Platforms as per requirement
- Different levels for attention to different components





An Evaluation - review

Item	Pit Level	Rail Level	Catwalk Level
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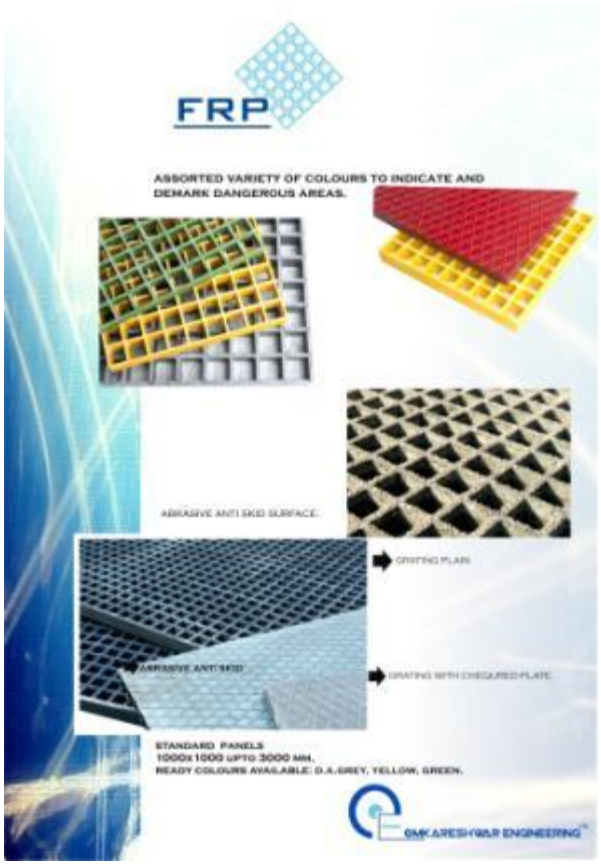
My View

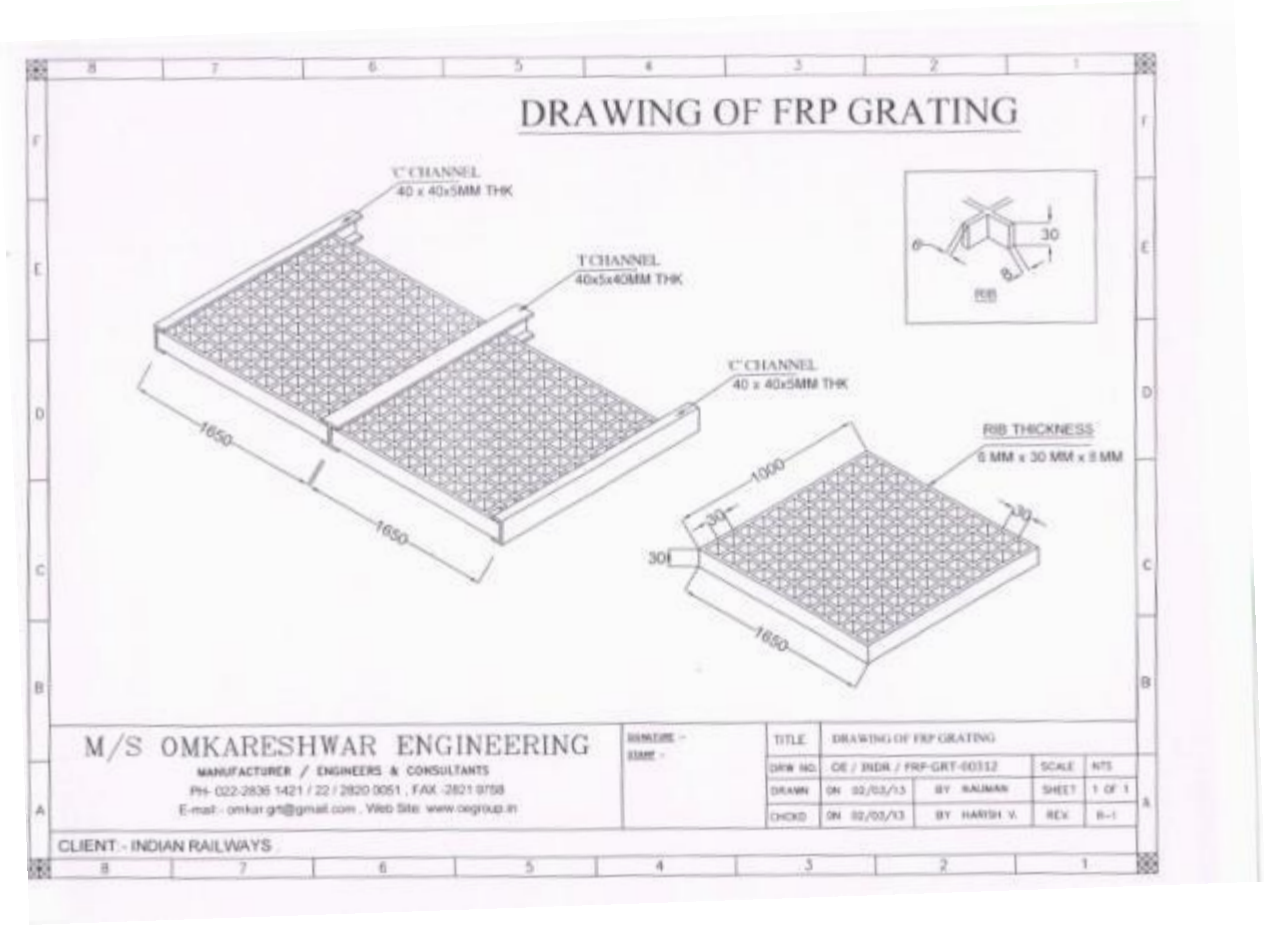
- Pit level floor is preferable.
  - Easy inspection and attention to under-gearing.
  - Airy, Open, Lighted.
  - But, Rails to be on pillars.
  - Also as per the latest CAMTECH drawing.
- With a low level pit, the attention to the coach external is a problem.
  - Scissor truck solution is attractive, but the scissor truck rising 5 meters is difficult to maintain.
- As of now, without a coach washing plant, catwalks are essential.
  - However, RCC catwalks can be substituted with metal and FRP grid catwalks.
  - These catwalks will address many of the inadequacies in an RCC catwalk.

A possible solution



- FRP grating instead of RCC catwalks
- GI Metal Structure to support the FRP gratings
- Will solve the light, dampness, look, life and air circulation issues


2500 m2
GRP GRATINGS


DRAWING OF FRP GRATING
'C' CHANNEL
40 x 40x5MM THK
T CHANNEL
40x5x40MM THK
'C' CHANNEL
40 x 40x5MM THK
RIB THICKNESS
5 MM x 30 MM x 5 MM
1650
1650
1000
30
30
30
30
6
30
5
M/S OMKARESHWAR ENGINEERING
MANUFACTURER / ENGINEERS & CONSULTANTS
TITLE
DRAWING OF FRP GRATING
SCALE
NTS
SHEET
1 OF 1
CLIENT :- INDIAN RAILWAYS

Comparison

RCC

2 sided 600 Meter catwalk, 1800mm

Thickness -150 mm

Concrete = 2*600*1.8*0.150=324 cum

Cost = @ Rs10,000 * 324

= Rs 32.4 lacs

Pillars, Beams, Foundation all extra.

ALSO: HW/MB div RCC estimate for 2 catwalks (600 ms, 1.8 meters wide) is **Rs 80 lacs**

FRP

2 sided 600 Meter catwalk, 1650mm

Thickness - 40 mm

FRP grating = 2*600*1.650= 1980 sqm

Cost = @ Rs 4000 * 1980

= Rs 80 lacs

Galvanized Iron Channels

I Channel separators = 1200*1.65= 1980 m

Cost = @Rs 205*1980 ~= **Rs 4 lacs**

I Channel Pillars = 1200 no * 3 = 3600 m

Cost = @Rs 205*3600 ~= **Rs 7.5 lacs**

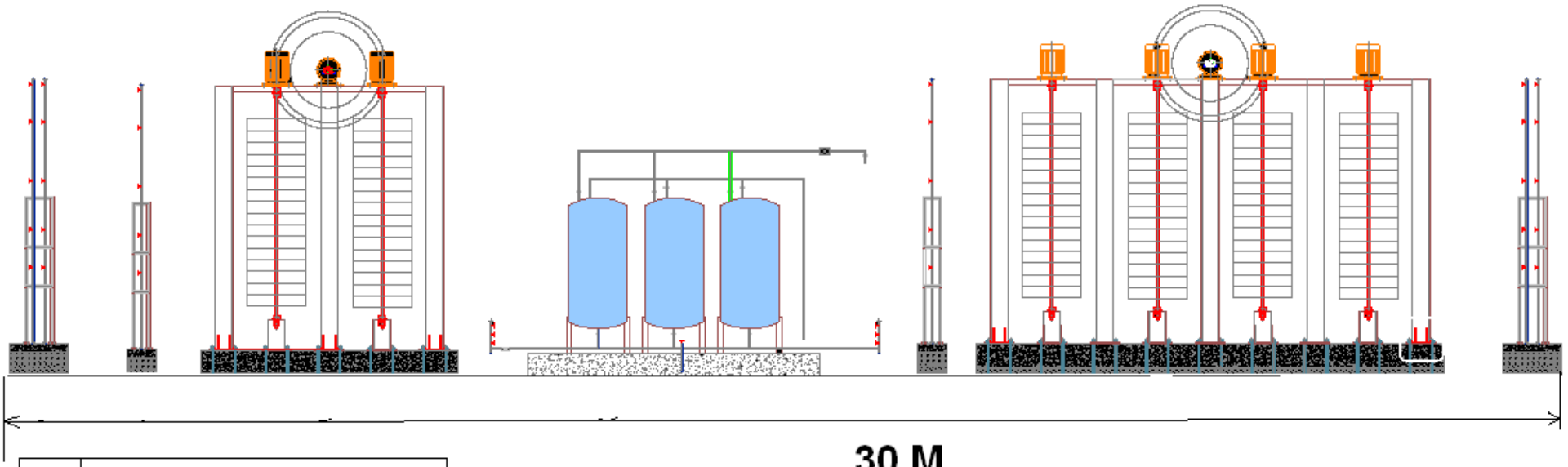
Concluding

1. Pit working level both (inside and outside) required. **But, on pillars.**
2. Catwalks are necessary for outside attention.
3. Alternate catwalk material, like FRP grid, appears as an attractive proposition.
   - Use of alternative material will be more expensive, but it would resolve a number of key issues.

Coach Washing Plant

- Low cost coach washing plant to Konkan design.
- Approximately Rs 1.5 cr
- 4 fabricated structures.
- Length of the plant 30M
- Width 5.26m across Track
- ETP and Softening plant

General Arrangement Drawing : Automatic Coach Washing Plant



30 M

1	Pre-wash Unit
2	Soap Solution Spray Unit
3	Soap Solution Brushing Unit
4	Undergear & Side gear cleaning Unit
5	Moistening Unit
6	Main Wash Unit
7	After wash

NOT TO SCALE

Acknowledgements

- Sanjay Gupta, CME Konkan
- Shubranshu, CME IROAF
- Tanmany Mehta, Sr.Prof IRIMEE
- Amitoj Ballabh, Sr.DME/BPL
- Praful Kohade, Sr.CDO/BCT
- Lokesh Singh, Sr.DME/LJN
- Krishnan Raman, Dy.CME/SWR
- Rakesh Tripathi, AGM/ONGC
- Mr Harresh Vasudev, VP ***M/s. OMKARESHWAR ENGINEERING***
- IRSME association